

REMARKS

Claims 1, 2, 4-19, 21-24, 26, and 27 are pending in the application, claims 3, 20, and 25 being canceled herein. Claims 1 and 19 are the only independent claims.

Interview Applicant wishes to thank the Examiner for the courtesy of the telephonic interview of December 12, 2007 with inventor Rashid Bashir and the undersigned attorney for applicants. During that interview, the applicant provided the Examiner with background information, including the current state of development of a commercial model. The Examiner provided suggestions regarding patentability and particularly identified channel structure 222 in applicants' Figure 4 as distinguishing over known prior art, including U.S. Patent No. 6,149,787 to Chow. The Examiner additionally pointed out that the branching channel structure of claim 3 needed to be associated with multiple chambers on the biochip. Applicants thank the Examiner for his assistance and particularly his observations as to patentable subject matter.

Claims Rejections - 35 U.S.C. § 112

Claims 20-24 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner specifically queries whether the "retention means" recited in dependent claim 20 differs from the "retention device" of independent claim 19.

Claim 20 has been canceled herein, incidentally to the amendment of claim 19 herein to more clearly distinguish the invention over the prior art. Claims 21-24 have been amended to be consistent with claim 19 and to ensure proper antecedent support.

Claims Rejections - Double Patenting

Claims 1-4, 7-21, and 24-27 stand rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,716,620.

Claims 5, 6, 22, and 23 stand rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,716,620 in view of U.S. Patent No. 6,576,459 to Miles et al.

In response to the rejection of claims 1-4, 7-21, and 24-27 under the judicially created doctrine of obviousness type double patenting, applicant submits herewith a Terminal Disclaimer duly executed by the undersigned attorney of record for applicant.

Claims Rejections - 35 U.S.C. § 103

Claims 1, 2, 8-12, 14, 15, 18-21, 24 and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,143,247 to Sheppard, Jr. in view of U.S. Patent No. 5,726,026 to Wilding et al.

Claims 10-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,143,247 to Sheppard, Jr. in view of U.S. Patent No. 5,726,026 to Wilding et al. and U.S. Patent No. 5,824,494 to Feldberg.

Claims 17 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,143,247 to Sheppard, Jr. in view of U.S. Patent No. 5,726,026 to Wilding et al. and U.S. Patent No. 5,670,031 to Hintsche et al.

Claims 22 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,143,247 to Sheppard, Jr. in view of U.S. Patent No. 5,726,026 to Wilding et al. and U.S. Patent No. 6,576,459 to Miles.

Claims 5, 6, 22, and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,716,620 to Bashir et al. in view of U.S. Patent No. 6,576,459 to Miles.

Claims 1 and 19 have been amended herein in response to the rejection of claims 1 and 19 under 35 U.S.C. § 103(a) and pursuant to observations made by the Examiner during the telephonic interview of December 12, 2007.

Claim 1 Claim 1 has been amended to incorporate limitations from claim 3, which has been canceled, and further language pertaining to the inlet port or expanded inlet section 222 shown in Figure 4 of applicants' disclosure.

As set forth in amended claim 1, a biosensor for concentrating and detecting living microorganisms in a macroscopic sample in a minimal time comprises a substrate, a detection chamber, specimen concentration means, a heater, and electrodes. The detection chamber is disposed on the substrate and defines a volume between 1 pico-liter and 1 micro-liter. The detection chamber is adapted to confine a composition containing microorganisms;. The specimen concentration means is connected to the detection chamber for rapidly concentrating the microorganisms in the detection chamber. The specimen concentration means includes a channel structure and a retention device at the detection chamber for capturing the microorganisms from a sample stream flowing in the channel structure. The channel structure includes a large inflow groove or trench, a substantially smaller channel extending to the detection chamber, and an inlet section between the inflow groove or trench and the smaller channel. The inlet section is of substantially smaller flow cross-section than the inflow groove or trench and substantially larger flow cross-section than the smaller channel. The heater is operatively connected to

the substrate to heat the composition in the detection chamber. The electrodes are mounted on the substrate in communication with the detection chamber to identify AC impedance changes within the detection chamber from bacterial metabolism of the microorganisms of the composition over time.

The prior art of record does not disclose or suggest a biosensor with the channel structure of amended claim 1. The known prior art does not disclose or suggest a channel structure including a large inflow groove or trench, a substantially smaller channel extending to the detection chamber, and an inlet section between the inflow groove or trench and the smaller channel, where the inlet section is of substantially smaller flow cross-section than the inflow groove or trench and substantially larger flow cross-section than the smaller channel.

The specification has been amended to provide antecedent support for the amended language of claim 1. The amended language does not constitute new matter as it describes a feature of applicants' invention clearly shown in Figure 4.

Claim 19 Claim 19 has been amended to incorporate the branching channel structure of claim 3 and to recite multiple detection chambers. As pointed out by the Examiner in the telephonic interview of December 12, 2007, the multiple detection chambers are the reason for the branching channel structure.

As set forth in amended claim 19, a biosensor for concentrating and rapidly detecting living microorganisms in a macroscopic sample comprises a substrate, a plurality of detection chambers, a plurality of retention devices, specimen concentration means, a heater and electrodes. The detection chambers are disposed on the substrate, each of the chambers defining a volume between 1 pico-liter and 1 micro-liter. The

retention devices are disposed at least in part on the substrate at respective ones of the detection chambers for capturing microorganisms from a flowing sample stream and retaining the microorganisms in the respective ones of the detection chambers. The specimen concentration means is connected to the detection chambers for rapidly concentrating the microorganisms in the detection chambers. The specimen concentration means has a branching channel structure including at least one large inflow groove or trench and a substantially smaller channel extending from the inflow groove or trench to the detection chambers. The heater is operatively connected to the substrate to heat a composition in the detection chambers. The electrodes are mounted on the substrate and disposed in communication with the detection chambers to identify AC impedance changes within the detection chambers from bacterial metabolism of the microorganisms over time.

The prior art of record does not disclose or suggest a biosensor with a branching channel structure extending to multiple detection chambers (as shown in Figure 3 of applicants' disclosure).

Claims 5, 6, 22, and 23 In response to the rejection of claims 5, 6, 22, and 23 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,716,620 to Bashir et al. in view of U.S. Patent No. 6,576,459 to Miles, applicants submit herewith a Declaration under 37 C.F.R. 1.130 averring that the present application and U.S. Patent No. 6,716,620 are currently owned by the same party and that the inventors of the present application are the prior inventors under 35 U.S.C. § 104.

Information Disclosure Statement Pursuant to the Duty to Disclose under 37

C.F.R. §1.56(a), applicant encloses herewith a copy of an Office Action issued recently by the Examiner in related U.S. Patent Application No. 10/172,263, filed June 14, 2002. It is believed that all of the prior art references cited in the divisional application are of record in the instant application.

The claim amendments, if any, made herein are made without prejudice to applicants' right to pursue additional subject matter in a separate continuation or divisional application.

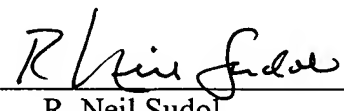
Conclusion

For the foregoing reasons, independent claims 1 and 19, as well as the claims dependent therefrom, are deemed to be in condition for allowance. An early Notice to that effect is earnestly solicited.

Should the Examiner believe that direct contact with applicant's attorney would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the number below.

Respectfully submitted,

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